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ABSTRACT

Such factors as type of farm, farm production region, and farm size affect the percentage of farms hiring workers, the number of hours worked by hired workers, the length of the farm workweek, and the hours of labor used per $100 of sales. Labor costs and shortages most directly affected farms that sold $20,000 or more of farm products in 1964 and 1966. In 1966, these farms produced 68 percent of all farm products sold and used 68 percent of all man-hours of hired labor. Yet the farm family was the major source of manpower in both years. Regular hired labor was important on farms with $40,000 or more in sales and a major source of hired manpower for dairy and livestock operations. Workweeks were shortest for tobacco farmers, longest for dairy farmers and livestock ranchers. To produce $100 of sales, more labor was used on small farms, particularly tobacco farms, than on large farms in both 1964 and 1966. Data in this report were derived from information obtained in two Pesticide and General Farm Surveys conducted by USDA's Economic Research Service on 1964 and 1966 farm operations. This report presents data for farms having sales of $5,000 or more. (Author)

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LABOR USED ON U.S. FARMS, 1964 and 1966

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Key words: Farm labor, Hired labor, Family labor, Regular hired labor, Farm workweek, and Sales of farm products.

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HIGHLIGHTS

Of farms with annual sales of $5,000 or more, those affected most by increases in labor costs and manpower shortages in 1964 and 1966 were farms with sales of $20,000 or more. These farms comprised 18 percent of all farms surveyed, produced 68 percent of all farm products sold, and used 68 percent of all man-hours of hired farm labor in 1966.

The farm family was the major source of manpower in both years. With the exception of families of livestock operators, the family increased its share of total farm labor inputs over the 2-year period on all types of farms. The family commitment to farm labor varied by farm size, farm type, and geographic location. About 36 percent of all farms with $5,000 or more in sales reported using only family labor in 1964, compared with 27 percent in 1966.

Type of farm, region, and size of farming operation influenced hiring practices and total labor demand. The regular hired worker became important on farms with $40,000 or more in sales, and was the major source of hired manpower for most of the dairy and livestock operations.

In the farming sector, there is great variation in the length of the workweek for both operators and hired help. In 1966, the operators' workweek averaged 54 hours--varying from 46 hours on tobacco farms to 66 hours on dairy farms. Regular hired workers in 1966 put in many hours wherever they worked--from 36 hours a week on tobacco farms to 55 hours on dairy farms and 56 hours on livestock ranches. The same range was found in 1964.

Small-scale farmers had to put in more than 3 1/2 hours of labor for every hour that the large-scale operator worked to derive $100 in sales in 1964. By 1966, this ratio had risen to 5 to 1.

Tobacco farmers in both crop years had to put in nearly three times as much labor per $100 of sales as cash grain farmers, and over two times as much as livestock ranchers.

LABOR USED ON U.S. FARMS, 1964 AND 1966

by

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INTRODUCTION

Many production economists measure a firm's economic soundness by the quality and cost of inputs in relation to the receipts for its product. Basic to any farm firm are the inputs of land, labor, and capital.

For many decades, the farmer worried about the quality of his land and the cost of capital, but rarely did he concern himself as much with the quality and cost of labor. He always had available a residual pool of unemployed or underemployed persons desirous of work. He had a natural resource of human energy that he could rely upon.

In the 1960's, with low unemployment in the total labor force and wages continuously increasing, the farmer found his labor resources drying up. He had to actively compete for labor. He had to either pay more to retain hired labor, use more family labor and more machines to replace hired labor, or restrict his farm size to the level that his family labor could maintain.

Many small farm operators are paying their hired labor partly with income they earn from off-farm employment. Large farm operators who must rely on hired labor are mechanizing, hiring only the more efficient workers, and working toward optimal use of all their inputs.

This study uses data from ERS Pesticide and General Farm Surveys on 1964 and 1966 farm operations to show that certain relationships do hold over a period of time--that type of farm, farm size, and geographic location determine to some extent how much and what kind of labor will be used. Of course, certain nonfarm factors--such as high wages, surplus labor, lack of job opportunities, and economic growth of an area--may be just as important.

In the 1964 study, farms were examined by region, farm size, and farm type to see if there was a relationship between any of these factors and the use of farm labor.1/ Only a few farms with less than $5,000 in annual sales were included. In the 1966 Pesticide and General Farm Survey on which 1966 data in this report are based, farms of all sizes were

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1/ Sellers, W.E., and Eichers, T.E. Farm Labor Inputs, 1964. U.S. Dept. Agr., Econ. Res. Serv., Statis. Bul. No. 438, June 1969.

studied. Therefore, in this report, which compares data for the 2 years, only farms with $5,000 or more in sales are discussed. For methodology and reliability of the 1966 Pesticide and General Farm Survey, see page 17 in the appendix to this report. Tables 3, 4, and 5 in the appendix compare the distribution of farms and value of sales in this study with such data in other national surveys.

CONCENTRATION OF FARMS, FARM PRODUCTS SOLD, AND FARM LABOR

Who is producing the bulk of our farm products? Who is most likely to be affected by our farm programs, increased farm labor costs, and the supply of rural manpower? The purpose of this section is to establish a perspective before a discussion of the quantity and kinds of farm labor used in 1966 and 1964 on various types and sizes of farms in selected farm production regions.

Farms with sales of $5,000 or more are important because they comprise more than half of all our farms and produce 93 percent of all farm products sold (table 1).

In the 1966 survey, farms with sales of $100,000 and over comprised only 1 percent of the farms, but sold 26 percent of all farm products sold and hired 28 percent of all regular labor. Extending this to farms with sales of $20,000 and over, 18 percent of the farms produced 68 percent of all farm products sold and 72 percent of the livestock. These farms used 68 percent of the total man-hours of hired labor and 77 percent of the man-hours of regular hired labor (table 2). This is a somewhat greater concentration of sales and labor on large farms than reported

Table 1--Number of survey farms and value of farm products sold, by sales of farm products, 48 States, 1966

Sales of farm products	Farms	Value of farm products sold			
		Total	Crops	Livestock	Other 1/
	Number	Million dollars			
All farms	16,164	224.8	79.0	144.6	1.2
	Percent				
$50-$4,999	49	7	8	6	16
$5,000-$9,999	19	10	13	8	7
$10,000-$19,999	14	15	17	14	9
$20,000-$39,999	12	23	26	22	19
$40,000-$99,999	5	19	22	18	11
$100,000 and over	1	26	14	32	38

1/ Nursery, greenhouse, and forest products.

Table 2.--Number of farms and distribution of hours of labor, by value of farm products sold, 48 States, 1966

Value of farm products sold	Farms 1/	Total hours of labor on all farms 2/	Hours of hired labor 2/			Distribution of hours			
							Hired labor		
			Total	Regular	Seasonal	Total hours	Total	Regular	Seasonal
	Thousands	Million hours				Percent			
$50-$2,499	1,110	1,702	88	24	65	14	4	2	6
$2,500-$4,999	449	1,364	96	33	63	11	4	2	6
$5,000-$9,999	600	2,366	260	102	159	19	10	7	16
$10,000-$19,999	458	2,293	337	183	154	19	14	12	16
$20,000-$39,999	376	2,304	518	336	182	19	21	23	18
$40,000-$99,999	149	1,323	582	394	188	11	23	26	19
$100,000 and over	41	814	602	416	186	7	24	28	19
All farms 3/	3,183	12,167	2,482	1,484	998	100	100	100	100

1/ Number of Farms and Land in Farms. U.S. Dept. Agr., Stat. Rpt. Serv., SPSY (1-69), Jan. 10, 1969. (Excludes Rhode Island, Hawaii, and Alaska.)

2/ Average hours of labor per farm by farm size (as reported in the 1966 Pesticide and General Farm Survey, U.S. Dept. Agr., Econ. Res. Serv., unpublished) multiplied by the number of farms in col. 1.

3/ Detail may not add to total because of rounding.

in 1964. These are the farms most directly affected by increases in labor costs and manpower shortages. It is these farms that must compete with nonfarm industry for skilled and competent full-time, year-round workers.

Labor estimates by farmers in the ERS 1966 Pesticide and General Farm Survey expanded to represent all farms in the 48 States approximated 12,167 million hours. This compares with 10,212 million hours reported by the Census of Agriculture for the 52-week period March 20, 1965, to March 19, 1966.2/ (See app. table 1 for a comparative distribution by economic class of farm.) The ERS survey data indicate that hired farmworkers performed 20 percent of all farmwork. This compares with 26 percent in the Census sample survey.

Although the Statistical Reporting Service (SRS) of USDA reports numbers of farmworkers and hours worked per week in the survey week, it does not publish total hours worked in farming. Expanding the SRS data from weeks to months permits development of an estimate of annual hours of farmwork. Such estimates for 1966 are 10,297 million hours, of which 23 percent were worked by hired workers (app. table 2). SRS data do not permit development of estimates by economic class of farm.

Total labor input may be overstated in the ERS survey, particularly labor contributed by the farm operator and his family. This kind of overstatement is more likely to occur in enumerative surveys than in mail surveys. Also, the operator is more likely to know, and is less inclined to overestimate, the hours of hired labor used. Thus, the difference between the contribution of hired workers reported in the ERS survey and that reported in the other two surveys probably results from the operator's overstatement of the family contribution.

The hours of farmwork developed from the 1966 Pesticide and General Farm Survey, from the 1965 Census of Agriculture sample survey, and from the SRS survey differ markedly from the estimated man-hours of farmwork published by ERS in Changes in Farm Production and Efficiency.3/ Data in that report are developed from secondary data. The man-hours used for farming in 1966 are developed by applying the number of manhours needed to perform all work per acre of crop or head of livestock to the number of acres of crops and units of livestock produced. This is quite a difference in concept--hours actually needed versus working hours, which include underemployment, coffee breaks, and the like.

DEMAND FOR HUMAN RESOURCES--COMPARISON OF 1966 WITH 1964

In evaluating human resource allocation on farms, we should determine the major demand areas. Does farm size 4/ affect demand for manpower? Would farms of the same size in different production regions require different amounts of labor and, in particular, different amounts of hired labor? What is the difference between demand for labor on a

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2/ Farm Labor, Vol. III, Part 2, U.S. Dept. of Commerce, Bureau of the Census, May 1968.

3/ U.S. Dept. of Agr., Econ. Res. Serv., Statis. Bul. 233, June 1966.

4/ Farm size in this study is measured by value of farm products sold during the year. For more detailed explanation, see p. 21.

tobacco farm in the Appalachian Region and demand on a Lake State dairy farm?

One purpose of this study is to examine labor demand differences and their magnitudes. This report shows that these differences persist over time and that, although less labor is required per farm, more farms are hiring labor. However, the comparisons from 1964 to 1966 are not for the entire population of farms; comparisons in this study include only farms having annual sales of $5,000 or more. Excluded are more than 1.5 million small farms that did not sell $5,000 of farm products in either 1964 or 1966.

Caution should be used in interpreting changes in labor use between years as close as 1964 and 1966. Differences between these years do not necessarily indicate trends. Because of variations in weather, in acreages of crops, in the nature of the samples, and in other accidental or temporary circumstances, appreciable differences in labor used in the 2 years may appear that do not indicate any basic change in patterns of labor use.

Effects of Farm Size

The majority of farms in every sales group hire some labor during the year. Between 1964 and 1966, the proportion of farms hiring labor increased at every level below $40,000 sales (table 3). For the largest farms, the percentage hiring remained about the same. Even so, the operator and his family furnished the major share of labor on all farms with less than $100,000 of sales. For farms with less than $20,000 of sales, the family did over four-fifths of the work during 1966. On large, class I farms (those with sales of $40,000 to $99,999), just over half the labor was provided by the family. In both 1964 and 1966, small and medium-size farmers relied mostly on family labor except at peak demand periods. Their labor supply, then, is probably adequate until one or more members go off to school or the military, or otherwise are not available. Then they must hire labor or restrict their farming operations. However, as brought out in other studies, an increasing number of farmers and their families are doing off-farm work.5/ This allows farmers to substitute low-paid hired farm labor for family labor as well as provide the family with greater income. This may be one of the reasons behind an increasing number of smaller farms using hired labor.

Acquiring enough labor to run an efficient, large-scale farm is much of the farm manpower problem. Although small farmers have some trouble hiring labor at a peak season, large commercial farms (whether family or corporate) have considerable difficulty all year long. In both 1964 and 1966, about 95 percent of all large farms hired labor and relied upon hired help to do 75 to 80 percent of the work.

Large-scale operations bring the operator into the competitive labor market--not only with other farmers but also with nonfarm businesses. Efficient large-scale operations mean mechanization. Mechanization means skilled workers (machine operators and mechanics), and skilled workers

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5/ U.S. Census Bureau, 1965 sample survey of agriculture, and Farm Income Situation, U.S. Dept. Agr., Econ. Res. Serv., FIS-214, July 1969.

Table 3.--Proportion of survey farms that hired labor and the proportion of labor performed by family and hired workers, by value of farm products sold, 48 States, 1964 and 1966 1/

Value of farm products sold	Percentage of farms hiring labor		Percentage of total man-hours worked by--2/			
			Operator and family		Hired workers	
	1964	1966	1964	1966	1964	1966
	Percent					
$5,000-$9,999	57	68	77	86	23	14
$10,000-$19,999	60	71	73	82	27	18
$20,000-$39,999	74	76	59	73	41	27
$40,000-$99,999	88	84	41	52	59	48
$100,000 and over	95	94	19	25	81	75
All sales groups	64	73	60	70	40	30

1/ Data in this table refer only to those farms with sales of $5,000 or more.

2/ These data are for farms that hired labor. Farms not hiring labor are excluded from last four columns.

mean higher cash wages, more supplemental benefits, and good labor-management relations. The "big farmer," then, must compete with nonfarm industry for competent, reliable workers.

The reduction in the proportion of labor done by hired workers, particularly on large-scale farms, may be due in part to labor legislation. In 1966, Congress passed amendments to the Fair Labor Standards Act (Public Law 89-601) that brought minimum wage coverage to certain farm-workers for the first time. A minimum wage of $1 per hour became applicable February 1, 1967, to certain workers on farms that had hired workers for 500 or more man-days in the peak calendar quarter of the previous year (1966). Thus, there was a conscious effort on the part of users of hired labor to restrict hiring in 1966. Also, hiring was restricted as a result of the 1966 cotton program, which materially reduced acreage--to a level one-third below 1964's.

Human Resource Allocation by Type of Farm

The majority of farms of all types in both 1964 and 1966 hired some labor during the year (table 4). During the 2-year interval, the proportion of farms hiring labor actually increased for all farm types except tobacco and "other field crop" farms.

About 36 percent of all farms used only family labor in 1964, compared with 27 percent in 1966. Family labor was heavily relied on by cash grain, tobacco, dairy, and "other livestock" farms. In 1966, family labor contributed about three-fourths of the manpower on these farms. Also, all

Table 4.--Proportion of survey farms that hired labor and the proportion of labor performed by family and hired workers, by type of farm, 48 States, 1964 and 1966 1/

Type of farm	Percentage of farms hiring labor		Percentage of total hours worked by--2/			
			Operator and family		Hired workers	
	1964	1966	1964	1966	1964	1966
	Percent					
Cash grain	58	69	63	73	37	27
Tobacco	96	93	58	75	42	25
Cotton	92	95	35	50	65	50
Other field crops	93	86	53	55	47	45
Dairy	56	70	69	79	31	21
Livestock ranches	61	72	58	53	42	47
Other livestock	60	70	74	76	26	24
General	63	76	54	61	46	39
All farms	64	73	60	70	40	30

1/ Data in this table refer only to farms with sales of $5,000 or more.

2/ These data are on farms that hired labor. Farms not hiring labor are excluded in the last four columns.

four types of farms used more family labor in 1966. In the case of cash grain and tobacco farms, this increase is probably due to more mechanization and technological change that resulted in less need for hired help.

In flue-cured tobacco marketing, a shift from tied leaves to untied tobacco reduced labor inputs by 4 hours per hundredweight of tobacco. In 1964, only 17 percent of the crop was marketed untied but by 1966 this labor-saving practice had been extended to 44 percent of the crop.

In dairy and "other livestock" farming, the increase in family labor may be due more to the increasing inability of farmers in these areas to compete for competent, year-round workers.

Because of the heavy seasonal need for manpower on "other field crop" farms and livestock ranches, the family was able to supply little more than half the labor in both 1964 and 1966. Families also supplied 54 and 61 percent of the labor on general farms in the 2 respective years. With the exception of families of livestock operators, the family increased its share of total labor input used over the 2-year period on all types of farms.

Regional Effects on Demand for Farm Labor

Topography, climate, and other environmental factors restrict certain types of farming to certain regions--and it is said that farm type and the kind and quantity of farm labor used within a region are directly related.

A basic factor in regional differences in labor use is the availability of human resources. Labor, like any other commodity, has a price, and the price of labor depends on supply and demand. The over-supply of unskilled, low-priced manpower in the South allows farmers to use labor in ways that are economically prohibitive in other regions.

More than 85 percent of the southern 6/ farms with sales over 5,000 hired labor in 1964 and 1966 (table 5). The only other region with such a propensity to use hired labor was the Southern Plains, where there has also been an abundance of low-priced, unskilled workers.

On farms hiring labor in the Southeast and Delta States, family labor accounted for less than half the manpower in 1964 and not much over half in 1966 (table 5). Yet, in the Corn Belt, Lake States, and Northern Plains, the family was the major source of labor--furnishing about 85 percent in each region. Of course, labor utilization practices differ among regions because of the kinds of crops grown or the type of farm operations peculiar to a region. In the Northeast and Lake States Regions, where dairy farming is the major farm activity, there is year-round work. The operator and his hired help work more weeks during the year and longer hours every day than do farmers in other regions. There is less demand for seasonal short-term employment.

In the Appalachian and Southeast Regions, cotton, tobacco, and fruit and nut farms require a heavy influx of labor for a short period of time. Because of the type of work and the lower wage structure on these farms, operators in the past could hire lower skilled workers than are required to operate expensive combines in the Corn Belt. However, with the dramatic increase in cost of labor in recent years, cotton, fruit and nut, and tobacco farmers are turning to more productive operations and using less labor. If the trend toward greater mechanization and technological improvement continues, these types of farms in the South will change their hiring practices considerably. We can then look for a more stabilized work force in the South, with less short-term work and greater emphasis on regular full-time employment.

Seasonality of the work force will be discussed at length in a forthcoming publication, and will be referred to only in general terms in this report.

We conclude that there is a regional factor influencing employment practices of farms--due to both environmental (soil, topography, and climate) and population characteristics of the regions.

6/ Southern farms here refers to those in the Appalachian, Southeast, and Delta States Regions.

Table 5.--Proportion of survey farms that hired labor and the proportion of labor performed by family and hired workers, by farm production region, 48 States, 1964 and 1966 1/

Farm production region	Percentage of farms hiring labor		Percentage of total hours worked by--2/			
			Operator and family		Hired workers	
	1964	1966	1964	1966	1964	1966
	Percent					
Northeast	67	75	61	66	39	34
Lake States	43	71	81	86	19	14
Corn Belt	58	61	78	83	22	17
Northern Plains	47	71	76	85	24	15
Appalachian	89	91	58	67	42	33
Southeast	89	70	44	53	56	47
Delta States	84	85	38	51	62	49
Southern Plains	83	90	52	63	48	37
Mountain	71	80	47	54	53	46
Pacific	76	77	45	39	55	61
All regions	64	73	60	70	40	30

1/ Data in this table refer only to farms with sales of $5,000 or more.

2/ These data are on farms that hired labor. Farms not hiring labor are excluded in the last four columns.

Weekly Work Patterns

Farm Size

The average farmer in 1964 and 1966, no matter what his farm sales, had less leisure time than the average nonfarm worker. He also worked more hours a week than his hired help. During both years, the operator averaged around 54 or 55 hours per week (table 6). On the small farms, he averaged about 51 hours a week during 1964 and 47 hours during 1966.

Operators of farms with sales between $20,000 and $39,999 averaged 61 hours of farmwork for those weeks they worked during 1964 and 1966. Operators in this size group put in more hours per week than operators on any other size of farm in 1966. In 1964, farm operators with $100,000 or more sales averaged 62 hours a week, the highest for any group that year. However, this was only an hour more than farm operators with sales between $20,000 and $39,999.

During 1964 and 1966, regular hired farmworkers had fewer hours of leisure than nonfarm workers. In 1964, their workweek ran from 42 hours on the smaller farms ($5,000 to $9,999 sales) to 58 hours per week on the large, class I farms ($40,000 and over) (table 6). In 1966, regular hired farmworkers had a shorter workweek than they did 2 years earlier on all farms with sales over $10,000. Even so, the number of hours they worked a week was more than that averaged by nonfarm employees.7/ In 1966, regular hired farmworkers averaged about as many hours per week on the smaller farms as they did on the largest farms.

Farm Type

The workweek varied considerably among farm types in both 1964 and 1966. In 1964, the operator's workweek ranged from 44 hours on tobacco farms to 69 hours on dairy farms. In 1966, the same widespread in the workweek was evident (table 7). Over the 2-year period, the workweek for most types of farm operators remained nearly the same.

The workweek of other family members declined by 37 percent from 1964 to 1966 (tables 6 and 7). Reduced cotton acreage and adoption of more mechanization and new technology enabled other family workers to reduce the length of their workweek on cotton, tobacco, and other field crop farms. But the greatest reduction in weekly hours occurred on livestock ranches.

The variation in the length of the workweek for regular hired help follows about the same pattern as for the operator. Hired workers on most livestock operations had a considerably longer workweek than those working on field crop farms. Regular hired help on livestock ranches worked half again as many hours as hired help on tobacco farms. Also, in 1964, hired workers on dairy farms had a workweek a third longer than did hired workers on tobacco farms. Unlike farm operators, regular hired workers showed shorter workweeks in 1966 than in 1964 on every type

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7/ The U.S. Dept. of Labor reported average weekly hours worked by production workers in total private industry in 1966 as 38.6. See Employment and Earnings Statistics for the United States, 1909-68. BLS Bul. No. 1312-6, Aug. 1968.

Table 6.--Average weekly hours of farmwork per worker, by family and hired workers, on survey farms that hired labor, by value of farm products sold, 48 States, 1964 and 1966 1/

Value of farm products sold	Average weekly hours worked per worker 2/							
	1964				1966			
	Family			Regular hired workers	Family			Regular hired workers
	Operator	Wife	Other family		Operator	Wife	Other family	
	Hours							
$5,000-$9,999	51	27	41	42	47	23	26	46
$10,000-$19,999	58	24	40	50	56	24	26	47
$20,000-$39,999	61	22	44	52	61	24	27	49
$40,000-$99,999	61	20	49	58	58	20	26	49
$100,000 and over	62	25	56	57	55	18	26	46
All sales groups 1/	55	25	43	53	54	23	27	47

1/ Data in this table refer only to farms with sales of $5,000 or more.
2/ Hours per week for the weeks that the workers performed farmwork.

Table 7.--Average weekly hours of farmwork per worker by family and hired workers, on survey farms that hired labor, by type of farm, 48 States, 1964 and 1966 1/

Type of farm	Average weekly hours worked per worker 2/							
	1964				1966			
	Family			Regular hired workers	Family			Regular hired workers
	Operator	Wife	Other family		Operator	Wife	Other family	
	Hours							
Cash grain	52	22	43	53	51	20	26	48
Tobacco	44	32	45	41	46	24	25	36
Cotton	48	27	47	51	50	20	22	47
Other field crops	53	26	62	47	52	27	25	44
Dairy	69	25	42	56	66	24	26	55
Other livestock	54	20	35	50	54	18	23	47
Livestock ranches	62	23	60	61	48	15	17	56
General	55	23	43	55	55	23	22	45
All farm types	55	25	43	53	54	23	27	47

1/ Data in this table refer only to farms with sales of $5,000 or more.
2/ Hours per week for the weeks that the workers performed farmwork.

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of farm operation. This may be due in part to the sizable increase in the use of seasonal labor. In 1966, seasonal workers accounted for a greater proportion of total hours of farmwork than they did in 1964.

Length of the workweek varies among farm operators as well as among their hired help. Dairy and livestock farms have a workweek almost 50 percent longer than nonfarm industry and even many other farming operations. Thus, there is little wonder that dairy and livestock farms have difficulty finding and keeping good hired help.

Returns to Labor, 1964 and 1966

Economies of scale occur if, as a firm or farm increases in size, the inputs used per unit of output decline as a result of more effective utilization.8/ This study, although examining only one input--labor--bears out this concept. Every type of farm operation showed less labor used per $100 of sales as size of the farming operation increased.

In both 1964 and 1966, operations on tobacco farms used more hours per $100 of sales than on any other type of farm (table 8).9/ Cash grain farms provide a contrast to tobacco farms. They used 65 percent fewer hours per $100 of sales than did tobacco farms in 1964 and in 1966.

In both years, livestock ranches were a close second to cash grain farms in low labor use per $100 of sales.

By contrast, dairy and cotton farms in both years were next to tobacco in high labor inputs.

For the "all sales" categories, there was some increase in labor per $100 of sales over the 2-year period on every type of farm except livestock ranches. Most of this increase was due to the increase in operator labor, much of which occurred on the smaller farms. Most types of farms above $20,000 in sales showed improvement in their labor-to-sales ratio over the 2-year period. All but cotton, general, and other livestock farms used less labor per $100 of sales in 1966 than 2 years earlier.

The hours of labor used per $100 of sales, even before consideration of other inputs, suggests that the small farmer receives little for his own labor. A small-scale farmer had to put in 3 1/2 hours of labor for every hour that the large-scale operator worked to get $100 in sales in 1964. By 1966, this ratio had risen to 5 to 1. Returns per hour of labor differ markedly by type of farm. A tobacco farmer in both crop years had to use nearly three times as much labor to sell $100 of product as a cash grain farmer, and over two times as much as a livestock rancher.

8/ Madden, J. Patrick, Economies of Size in Farming, U.S. Dept. Agr., Econ. Res. Serv., Agr. Econ. Rpt. 107, Feb. 1967.

9/ This study reports labor for all operations, not just for tobacco or grain, but for all crops or livestock grown and sold on a particular type of farm.

Table 8.--Hours of labor used per $100 of sales on survey farms that hired labor, by value of farm products sold and by type of farm, 48 States, 1964 and 1966 1/

Type of farm	Hours of labor used per $100 of sales									
	1964					1966				
	Average, all sales classes	$5,000-9,999	$10,000-19,999	$20,000-39,999	$40,000 and over	Average, all sales classes	$5,000-9,999	$10,000-19,999	$20,000-39,999	$40,000 and over
	Hours									
Cash grain	19	30	22	17	13	21	40	26	17	11
Tobacco	53	60	46	34	--	60	69	46	32	25
Cotton	33	56	33	28	24	40	60	36	26	30
Other field crop	29	50	33	22	18	29	43	34	21	13
Dairy	34	59	40	29	14	42	69	42	24	16
Other livestock	20	39	26	17	9	32	55	29	18	8
Livestock ranches	24	53	37	25	11	22	36	30	20	9
General	19	41	26	19	10	37	59	34	23	15
All farm types	27	48	33	24	14	34	55	33	19	11

1/ Data in this table refer only to farms with sales of $5,000 or more.

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APPENDIX

Appendix table 1.--Hours of farmwork by value of farm products sold, 1965 Supplemental Census Survey and 1966 Pesticide Survey

Value of farm products sold	1965 Census		Percentage distribution	
	Incomplete 1/	Adjusted 2/	Census	Pesticide Survey
	Mil. hours	Mil. hours	Percent	Percent
$50-$2,499	1,650	1,970	18	14
$2,500-$4,999	1,126	1,181	11	11
$5,000-$9,999	1,957	1,977	18	19
$10,000-$19,999	2,163	2,193	20	19
$20,000-$39,999	2,485	2,505	23	30
$40,000-$99,999				
$100,000 or more	831	1,173	11	7
Total	10,212	10,999	100	100

1/ Excluded from the total are hours for: children ages 10 to 13, family workers on large-scale farms, hired workers on large-scale farms with wage bills of less than $10,000, and contract workers.

2/ Adjusted to include hours of workers cited in footnote 1. Input by children arbitrarily distributed among the farms with less than $20,000 of sales.

Appendix table 2.--Estimated hours of farmwork, 1966 1/

Month	Total		Family		Hired	
	Workers	Hours	Workers	Hours	Workers	Hours
	Thous.	Mil.	Thous.	Mil.	Thous.	Mil.
January	3,754	532	3,077	433	677	99
February	4,049	558	3,258	453	791	105
March	4,562	751	3,584	597	978	154
April	5,035	841	3,906	673	1,129	168
May	5,586	1,013	4,137	790	1,449	223
June	6,270	1,103	4,205	818	2,065	285
July	6,212	1,055	4,155	765	2,057	290
August	6,155	1,030	4,212	755	1,943	275
September	6,213	1,027	4,352	762	1,861	265
October	5,923	1,041	4,357	796	1,566	245
November	4,824	761	3,737	601	1,087	160
December	3,974	585	3,217	467	757	118
Total or average	5,214	10,297	3,854	7,910	1,360	2,387

1/ Developed from data in Farm Labor, USDA-SRS, selected issues, 1966-67.

Scope and Method of 1966 Survey

Findings in this study for 1966 are based on information obtained in the ERS 1966 Pesticide and General Farm Survey, a nationwide survey taken in 1967 and based on 1966 farm operations. About 9,600 farmers in 417 counties throughout the 48 contiguous States were enumerated.

The Standards and Research Division of the U.S. Department of Agriculture's Statistical Reporting Service (SRS) designed the nationwide samples from which farmers were selected for interview. The Data Collection Branch in SRS's Survey and Data Division assisted in developing the final format of the questionnaires and supervised the collection of data through their State statistical offices.

Farmers were selected for interview on the basis of a stratified random sample designed to represent all farms. A proportionately greater number of larger farms was included in the sample. Farms with sales of $10,000 to $39,999 were sampled at four times the rate of those with sales of less than $10,000. Farms with sales of $40,000 or more were sampled at twice the rate of those with sales of $10,000 to $39,999. However, weighting factors were applied in the programing to properly weight each economic class. Data on farms with sales of:

Less than $10,000 were multiplied by 4;
$10,000 to $39,999 were multiplied by 1; and
$40,000 and over were multiplied by 1/2.

For persons interested in evaluating the findings of the 1966 Pesticide and General Farm Survey and comparing them with findings of other farm surveys, see the tables in this appendix.

Only farms meeting the Census definition of a farm are included in the labor tabulations. Usable labor information was obtained from 16,249 farms when the adjusted factors were applied.

For definitions used and States included in each of the farm production regions discussed in this report, see pages 21-23.

Appendix table 3.--Distribution of farms by economic class from selected surveys or from estimates based on surveys

Economic class	1964 Census of Agriculture 1/	1965 Census of Agriculture, special labor study 2/	1966 ESAD estimate of farms based on census and SRS data 3/	1966 Pesticide and General Farm Survey 4/	
				All farms in survey	Farms with valid labor data
	Percent				
Class VI, $50-$2,499	42.4	43.0	43.0	40.7	33.7
Class V, $2,500-$4,999	14.1	13.9	11.6	13.4	15.3
Class IV, $5,000-$9,999	16.0	15.8	14.3	17.3	18.8
Class III, $10,000-$19,999	14.8	14.3	15.5	13.8	14.5
Class II, $20,000-$39,999	8.2	13.0	9.9	10.0	11.7
Class I, $40,000 and over	4.5		5.7	4.8	6.0
	Number				
All economic classes 5/	3,157,857	3,197,000	3,239,000	18,961	16,249

1/ 1964 Census of Agriculture, Vol. II, General Report. Bureau of the Census.
2/ 1965 Census of Agriculture Special Labor Study, Vol. III, Part 2. Bureau of the Census.
3/ 1966 estimates by U.S. Dept. Agr., Econ. Res. Serv., Econ. and Stat. Anal. Div.
4/ 1966 Pesticide and General Farm Survey. U.S. Dept. Agr., Econ. Res. Serv., unpublished.
5/ All farms included; i.e., commercial, part-time, part-retirement, and abnormal farms.

Appendix table 4.--Distribution of value of sales by economic class for three major surveys or estimates

Economic class	1964 Census of Agriculture 1/	1966 Pesticide and General Farm Survey 2/	1966 ESAD estimates based on census and SRS 3/
	Percent		
Class VI, $50-$2,499	3.2	3.0	3.1
Class V, $2,500-$4,999	4.6	4.2	3.2
Class IV, $5,000-$9,999	10.4	9.3	7.9
Class III, $10,000-$19,999	18.7	14.4	16.7
Class II, $20,000-$39,999	20.2	22.7	20.6
Class I, $40,000 and over	42.5	46.4	48.5
All economic classes 4/	100.0	100.0	100.0

1/ 1964 Census of Agriculture, Vol. II, General Report, table 15, col. 2. Bureau of the Census.
2/ 1966 Pesticide and General Farm Survey. U.S. Dept. Agr., Econ. Res. Serv., unpublished.
3/ 1966 estimates by U.S. Dept. Agr., Econ. Res. Serv., Econ. and Stat. Anal. Div.
4/ Total value of all farm sales in 1964 Census of Agriculture was $35,294,000,000; for farms in the 1966 Pesticide and General Farm Survey, $244,984,156; and for ESAD 1966 estimates, $43,180,000,000.

Note: Detail may not add to totals because of rounding.

Appendix table 5.--Distribution of farms by type of farm, two sources

Type of farm	Farms		
	1964 Census of Agriculture 1/	1966 Pesticide and General Farm Survey 2/	
		All farms in survey	Farms with valid labor data
	Percent		
Cash grain	16.7	19.8	16.1
Tobacco	7.4	5.9	9.4
Cotton	6.4	2.8	3.6
Other field crops	1.3	1.3	1.1
Vegetable	1.1	1.2	1.3
Fruit and nut	2.7	2.3	2.1
Poultry	3.3	3.1	2.0
Dairy	12.7	17.6	13.2
Other livestock	27.9	32.2	32.9
Livestock ranches	3.4	1.8	1.6
General	9.0	5.6	5.3
Miscellaneous	8.0	6.4	11.4
All farm types 3/	100.0	100.0	100.0

1/ 1964 Census of Agriculture, Vol. II, General Report, table 15. Bureau of the Census.
2/ 1966 Pesticide and General Farm Survey. U.S. Dept. Agr., Econ. Res. Serv., unpublished.
3/ All farms included, i.e., commercial, part-time, part retirement, and abnormal farms.

Note: Detail may not add to totals because of rounding.

Definitions

Farmwork--includes time spent tending crops and livestock and overhead jobs such as constructing and repairing fences and farm buildings, maintaining and repairing machinery, and similar farm maintenance jobs. Note: Time spent for planning and managing the farm operations is excluded. Examples: farm record keeping, attending educational or farm business meetings, making farm financial arrangements, and performing housework are not considered to be farmwork.

Regions--States included in each of the 10 farm production regions are:

Northeast
- Maine
- New Hampshire
- Vermont
- Massachusetts
- Rhode Island
- Connecticut
- New York
- New Jersey
- Pennsylvania
- Delaware
- Maryland

Appalachian
- Virginia
- West Virginia
- North Carolina
- Kentucky
- Tennessee

Southeast
- South Carolina
- Georgia
- Florida
- Alabama

Lake States
- Michigan
- Wisconsin
- Minnesota

Corn Belt
- Ohio
- Indiana
- Illinois
- Iowa
- Missouri

Mountain
- Montana
- Idaho
- Wyoming
- Colorado
- New Mexico
- Arizona
- Utah
- Nevada

Delta States
- Mississippi
- Arkansas
- Louisiana

Northern Plains
- North Dakota
- South Dakota
- Nebraska
- Kansas

Southern Plains
- Oklahoma
- Texas

Pacific
- Washington
- Oregon
- California

Economic Class--This study uses the same basic economic classes as the Bureau of the Census in the Census of Agriculture.

Economic class	Annual sales of farm products
Class VI	$ 50-$2,499
Class V	$ 2,500-$4,999
Class IV	$ 5,000-$9,999
Class III	$ 10,000-$19,999
Class II	$ 20,000-$39,999
Class I	$ 40,000 and over Divided into two parts: a. $40,000-$99,999 b. $100,000 and over

Type of Farm as Defined in 1966 Survey

Type of farm	Source of cash income
	(Products with sales value representing 50 percent or more of total value of all farm products sold.)
Cash grain.....	Corn, sorghums, small grains, soybeans for beans, cowpeas for peas, dry field and seed beans, and peas.
Tobacco.....	Tobacco.
Cotton.....	Cotton.
Other field crop.....	Peanuts, potatoes (Irish and sweet), sugarcane for sugar or sirup, sweet sorghums for sirup, broomcorn, popcorn, sugar beets, mint, hops, and sugar beet seed.
Vegetable.....	Vegetables.
Fruit and nut.....	Berries, other small fruits, tree fruits, grapes, and nuts.
Poultry.....	Chickens, chicken eggs, turkeys, and other poultry products.
Dairy.....	Milk and cream. The criterion of 50 percent of total sales was modified in the case of dairy farms. A farm having value of sales of dairy products amounting to less than 50 percent of the total value of farm products sold was classified as a dairy farm, if: (a) Milk and cream sold accounted for more than 30 percent of the total value of products sold and (b) Milk cows represented 50 percent or more of total cows and (c) The value of milk and cream sold plus the value of cattle and calves sold amounted to 50 percent or more of the total value of all farm products sold.
Livestock ranches.....	Farms in the 17 conterminous Western States, Louisiana, and Florida were classified as livestock ranches if the sales of livestock, wool, and mohair represented 50 percent or more of the total value of farm products sold and if pastureland or grazing land amounted to 100 or more acres and was 10 or more times the acreage of cropland harvested.

Type of Farm as Defined in 1966 Survey

Type of farm	Source of cash income
Livestock other than dairy and poultry.....	Cattle, calves, hogs, sheep, goats, and wool and mohair, except for farms in the 17 conterminous Western States, Louisiana, and Florida that qualified as livestock ranches.
General.....	Field seed crops, hay, and silage. Also, a farm was classified as general if it had cash income from three or more sources and did not meet the criteria for any other type.
Miscellaneous.....	Nursery and greenhouse products, forest products, mules, horses, colts, and ponies. Also, all institutional farms and Indian reservations.

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